

AMENDMENT TO THE CLAIMS

1. (canceled)

2. (new) A robotic tube handler system comprising:

- a robotic tube handler having:

- a housing with a perimeter rectangular frame having sides;

- a bed in the perimeter frame for orthoganal placement of tube racks, the bed having a seating structure in which standard tube racks seat in a predefined array;

- a tube pick-up mechanism having:

- a crossbar transport unit with tracks on two opposite sides of the frame;

- a cross beam with two post supports spanning the bed wherein the two post supports engage the tracks;

- a transport assembly with a motor for fore and aft transport of the crossbar transport unit;

- an elevator carriage supported on the cross beam with a transport mechanism having a motor for side to side transport of the elevator carriage on the cross beam;

- an elevator assembly;

- a pick head unit wherein the elevator assembly has a transport mechanism with a motor that vertically displaces the pick head unit, the pick head unit having an actuatable pick head; and,

- a controller with a control unit having electronics

operationally connected to the drive motors for precision control of X, Y, Z motion of the pick head unit and actuation of the pick head for select engagement and precision transport of tubes in tube racks seated in the bed.

3. **(new)** The robotic tube handler system of claim 2 wherein the housing has a platform with a parking holder for placement of a limited number of tubes, typically when sorting.

4. **(new)** The robotic tube handler system of claim 2 wherein the housing has a platform with a shuttle holder for placement of a limited number of tubes, typically when transferring to another adjacent robotic tube handler.

5. **(new)** The robotic tube handler system of claim 2 wherein the housing has a platform with an identification station that verifies the identity of a discrete tube.

6. **(new)** The robotic tube handler system of claim 5 wherein the identification station has a barcode reader.

7. **(new)** The robotic tube handler system of claim 5 wherein the identification station has a RFID reader.

8. **(new)** The robotic tube handler system of claim 2 wherein the pick head unit on the transport mechanism of the elevator assembly is replaceable with a tube fill unit.

9. **(new)** The robotic tube handler system of claim 2 wherein the pick head unit has a pick head for selectively picking a single tube from a tube rack, the pick head having four pick fingers that spread when actuated, the pick fingers being configured to selectively and releasably engage a single tube in a rack.

10. **(new)** The robotic tube handler system of claim 2 wherein the system includes racks that have a marking on the rack and the tube handler has a marking reader that reads the marking on the rack and identifies the rack.

11. **(new)** A robotic tube handler system comprising:

a robotic tube handler having:

a bed that supports a plurality of tube racks having tubes in an array;

a pick head unit;

an X,Y,Z transport mechanism that transports the pick head unit in X, Y, Z directional displacements over the bed wherein the pick head unit has a pick head for selectively picking a single tube from a tube rack, the pick head having four pick fingers that spread when actuated, the pick fingers being configured to selectively and releasably engage a single tube in a rack; and,

a controller having a tube management program for selectively locating and engaging a single tube and transporting the tube to a predefined location.

12. **(new)** The robotic tube handler system of claim 11 wherein the four pick fingers are slender and configured to drop into the four spaces of closely spaced

matrix arranged tubes.

13. **(new)** The robotic tube handler system of claim 11 wherein the bed has a frame with sides and wherein the X, Y, Z transport mechanism has a crossbar transport unit with a cross beam with two post supports spanning the bed wherein the crossbar transport unit is displaceable fore and aft on the frame.

14. **(new)** The robotic tube handler system of claim 13 wherein the crossbar transport unit has an elevator carriage supported on the cross beam wherein the elevator carriage and cross beam have a transport mechanism for side to side transport of the elevator carriage on the cross beam.

15. **(new)** The robotic tube handler system of claim 14 wherein the crossbar transport unit has a pick head wherein the elevator carriage and pick head have an elevator assembly that vertically displaces the pick head unit.

16. **(new)** The robotic tube handler system of claim 15 wherein the pick head unit includes an actuator engaging the pick fingers.

17. **(new)** The robotic tube handler system of claim 16 wherein the actuator has a cam device to spread and close the fingers.

18. **(new)** The robotic tube handler system of claim 17 wherein the cam device is spring biased to close the fingers and, by a solenoid, actuated to open the fingers.